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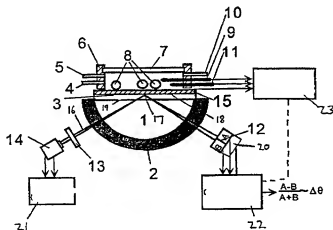
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(54) Title: SURFACE PLASMON RESONANCE DETECTION WITH HIGH ANGULAR RESOLUTION AND FAST RESPONSE TIME



(57) Abstract

A device and method of detecting surface plasmon resonance for sensing molecules or conformational changes in molecules with high resolution and fast response time is disclosed. Light from a light source (14) is focused through a prism onto a metal thin film (15) on which sample molecules to be detected are adsorbed. The total internal reflection of the laser/incident light is collected with a differential position or intensity sensitive photo-detecting device instead of a single cell or an array of photo-detectors (12) that are widely used in previous works. The ratio of the differential signal to the sum signal of the differential position or intensity sensitive photo-detecting device (12) provides an accurate measurement of the shift in the surface plasmon resonance angle caused by the adsorption of molecules onto the metal films (15) or by conformational changes in the adsorbed molecules. The present invention requires no numerical fitting to determine the resonant angle and the setup is compact and immune to background light. The methods and sensors of this invention can be used in numerous biological, biochemical, and chemical applications such as measuring subtle conformational changes in molecules and electron transfer reactions can be studied.